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EXAMINER	
JEAN BART, RALPH	

ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 09/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/604,182	KILLINGER, DENNIS K.	
	Examiner	Art Unit	
	Ralph Jean-Bart	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/24/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office Action is a first action on the merits. Claims 1-33 are pending in this office action.

Objection

The first paragraph of the specification is objected to due to claim of ***§371*** status instead of **§ 111(a)** status. Correction is required.

Claim 26 is objected to because of the following informalities: The applicant is using the word "a is used" (see line 4) should be changed to --**area is used**--. Appropriate correction is required.

Specification

The disclosure is objected to because of the following informalities:

Paragraph 0007, the fist sentence is incomplete.

Paragraph 0021 introduces "an *optical* bandpass filter may be *electrically* connected" [emphasis added] the content of this sentence is not clearly understood, and is technically incorrect.

Paragraph 0034 lines 6 introduces a "fairly lowlaser source" is grammatically incorrect.

Paragraph 0037 is incomplete.

Paragraph 0043 introduces a "pointcommunication" is grammatically incorrect.

Paragraphs [0015] and [0042] introduce "a # to 2 # steradians" which should be changed to **--π to 2 π steradians--**

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 20-24, 26-27, 29 and 32-33 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not adequately teach how to transmit data using a LIDAR beam. For example, the LIDAR Tutorial paper discusses three basic generic types of lidar, namely range finders, Differential Absorption Lidar and Doppler lidar, none of which transmit modulated data as claimed and described. Further, a review of the prior art did not show any other references capable of enabling this function.

Claims 12-17 and 20-24, 26-27, 29 and 30-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 12-17 recite the limitation, "having a # to 2# steradians" which appears to be typographically incorrect. For the purpose of applying art, the Examiner construes a # to 2 # steradians as -- **π to 2 π steradians**--.

Claims 30 and 32 recite the limitation, "an optical communication". There is insufficient antecedent basis for this limitation in the claim, because "an optical communication" has not been defined in the specification. Therefore the terms "an optical communication" is misleading and not understood. (See MPEP *§ 1.75 d(1).* For the purpose of applying art, the Examiner interprets an optical communication to be the "LIDAR Beam" of claim 20 or "modulated light" of claim 18.

Claims 31 and 33 recite the limitation, "a common optical communication". There is insufficient antecedent basis for this limitation in the claim, because "a common optical communication" has not been defined in the specification. Therefore the terms "a common optical communication" is misleading and not understood. (See MPEP *§ 1.75 d (1).* For the purpose of applying art, the Examiner interprets a common optical communication to be the "LIDAR Beam" of claim 20 or "modulated light" of claim 18.

Claims 20-24, 26-27, 29 and 32-33 recite the transmission of data using a LIDAR beam, which has been discussed above. Because this concept has not been

adequately described in the specification, the meaning attributable to the claims is not clear.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Drake (U.S. 4,627,106). The Drake reference teaches a communication device adapted to reflect signals from remote targets positioned in an environment external to the environment of the communication device (see Figure 1, elements A, B and C),

comprising a first data communication device adapted to transmit data (see Figure 3, source 16);

a laser source modulated by said first data communication device (see figure 3, laser 10 and 14);

a transmitter telescope adapted to aim modulated light from said laser source to a remote target (see figure 1, element C and figure 3, element 26) positioned in an environment external to the environment of said communication device (see figure 1, element A and figure 3, elements 20 and 24, see also column 2, line 63-column 3, line 5);

a second data communication device adapted to receive data (see figure 1, element B and figure 3, elements 30 and 32);

an optical detector connected in driving relation to said second data communication device, said optical detector adapted to generate electrical signals corresponding to detected optical signals (see figure 3, element 30);

a receiving telescope adapted to collect modulated light reflected from said remote target and to deliver said modulated light to said optical detector (see figure 3, elements 46 and 48);

a barrier means adapted to be positioned between said first and second data communication devices, said barrier means preventing line-of-sight communication between said first and second data communication devices (see figure 1, element D);

whereby said transmitter telescope causes modulated light to reflect from said remote target (see column 3, lines 32-36);

whereby said receiving telescope causes reflected light to focus on said optical detector (see column 4, lines 32-45); and

whereby said second data communication device receives electrical signals from said first data communication device (see Abstract, last sentence).

With respect to claim 20, as shown in applicant's figure 4, the LIDAR is merely operating as a generic laser. Therefore, the limitations of claim 20 are met by the Drake reference as applied above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 20-22 and 24-27 are rejected under 35 U.S.C. 103(a) as obvious over Drake (U.S. 4,627,106) in view of Durant *et al.* (U.S. 6,016,212) and Geiger (U.S. 5,250,810). The Drake reference has been discussed above. However, the Drake reference does not teach transmitting data using LIDAR.

As noted above, the Drake reference teaches transmitting a data signal over remote distances by reflecting a beam of light off a remote target so that optical communications may take place even when the end points are not in line-of-sight relation. As applied to claim 18 above, the Drake reference alternatively teaches all of the elements of claim 20 except the use of a LIDAR beam.

The Durant reference teaches an optical data communication system transmitting signals remotely via telescopes, and further using multiple wavelengths to transmit multiple streams of data (see column 2, lines 51-57). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the device taught by Drake to include multiple optical wavelengths to communicate different communication signals simultaneously and thereby increase the information carrying capacity of the system (see Durant, column 1, lines 20-23). Note that with respect to claim 21, i.e., the electrical signal

conditioner between the data transmitting device and the laser, it is inherent that the signals transmitted (i.e., plain old telephone service (POTS), video service, integrated digital services network (ISDN) service, satellite-originated television service, etc.) must be conditioned because they are not otherwise capable of directly modulating the lasers, (see also Durant, column 2, lines 30-38). Further, with respect to claim 22, and the electrical signal conditioner between the detector and the data receiving device, Durant teaches control circuitry 52 (see also column 3, lines 21-24).

However, the combination discussed above does not teach a LIDAR beam for communication.

The Geiger reference teaches a DIAL LIDAR system that measures atmospheric targets. It is noted that the structure of the device taught by Geiger is remarkably similar to the system taught by Durant. For example, compare the multiple wavelength sources of Durant (see figure 1, light sources 14, multiplexer 16) with the time multiplex transmitter 100 of Geiger (see figure 1A, coherent light sources 102a-102f and optics through beam splitter 132) and the demultiplexer of Durant (see figure 1, element 46 and figure 4, light diffraction grating 102 and respective detector elements 104a-104d) with the lidar receiver of Geiger (see figure 5, diffraction grating 514 and detectors 520A through 520F). The Geiger reference teaches a system that is suitable for transmitting over long distances (greater than 1 km, see column 4, lines 4-8) and that operates well under most meteorological conditions (see column 3, lines 10-12). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have used a LIDAR type system as taught by

Geiger for the transmission beam in the combination discussed above of Drake and Durant to provide communications under most meteorological conditions.

With respect to claims 24 through 27, the same target would be used in the above combination for each of the multiple wavelengths, note single beams for each wavelength (see Durant, figure 1, collimated light beam 28; Geiger, figure 3, single output beam 312, compare Drake, figure 1).

With respect to claim 21 and 22, Durant teaches an electrical signal conditioning (see figure 1 control circuitry 52, Television 54, telephone 56 and computer 58).

Claims 1,2, 6,10,11, 19 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drake (U.S. 4,627,106) in view of Onaka et al (U.S. 5,696,859).

The Drake reference has been discussed above with respect to claims 18 and 20. The Drake reference does not teach transmitting and detecting multiple data signals on multiple wavelengths, or an optical bandpass filter to pass preselected wavelengths.

However, the use of multiple wavelengths to simultaneously communicate multiple streams of information (i.e., messages) was well known in the art at the time the invention was made. For example, Onaka teaches a multiple wavelengths (see figure 14 transmission light source λ_1- λ_n), a modulating device adapted to modulate each of said multiple wavelengths so that multiple messages are transmitted simultaneously (see figure 14, laser diode driving circuit 104; column 13 lines 50-53), an optical band pass filter adapted to pass preselected wavelengths of light and reject

wavelengths of light outside of said preselected wavelengths (see figure 15, optical filter array 180), multiple messages are simultaneously transmitted along multiple wavelengths (see figure 15, data #1 out, data #2 out etc.).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Communication system of Drake by incorporating a modulation device for modulating multiple messages on multiple different wavelengths as taught by Onaka in order to increase the capacity of the communication system of Drake, and further, to include the optical bandpass filter as taught by Onaka to adjust or separate the multiple wavelengths of light (see Onaka column 1 lines 32-39).

With respect to claims 19 and 23.The Drake reference has been discussed above with respect to claims 18 and 20. The Drake references fail to teach an optical bandpass filter. However Onaka teaches an optical band pass filter (see figure 15, optical filter array 180), so that multiple messages are simultaneously transmitted along multiple wavelengths (see figure 15, data #1 out, data #2 out etc.)

With respect to claim 2, Drake teaches that the light source is a laser (see figure 3 element 10).

With respect to claim 11, Drake teaches said light reflective target is a second structure external to a first structure adapted to house said first and second data communication devices (see column 4 lines 46-49).

With respect to claim 10, Drake teaches a building which is similar to a tree

(see column 4, lines 46-49). It would have been obvious to use a tree or ~~order~~ other stationary object if no other structure is available to act as a target.

Claims 1,6, 3-5, 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshima et al (No 5,986,787), in view of Onaka et al (U.S. patent No 5,696,859).

With respect to claim 1, With respect to claim 1, Ohshima teaches a communication device for transmitting signals to a receiver (see figure 1A transceiver 21), a detector (see figure 1A photo emissive 221), a target fixed in line-of-sight relation to said optical light source and in line-of-sight relation to said detector (see figure 1A, ceiling); a modulating device connected in modulating relation to said optical light source (see figure 11, laser 172; column 2 lies 18-19); one detector adapted to demodulate light scattered by said target (see figure 1A, photo receptor 223). Ohshima fails to teach a multiple wavelengths, multiple messages, a modulating device adapted to modulate each of said multiple wavelengths so that multiple messages are transmitted simultaneously, an optical band pass filter adapted to pass preselected wavelengths of light and reject wavelengths of light outside of said preselected wavelengths, whereby multiple messages are simultaneously transmitted along multiple wavelengths, and whereby multiple messages are individually detected by said detector.

However, the use of multiple wavelengths to simultaneously communicate multiple streams of instruction (i.e., messages) was well known. For example, Onaka teaches a multiple wavelengths (see figure 14 transmission light source λ_1- λ_n) a modulating device adapted to modulate each of said multiple wavelengths so that multiple messages are transmitted simultaneously (see figure 14, laser diode driving

circuit 104; column 13 lines 50-53), an optical band pass filter adapted to pass preselected wavelengths of light and reject wavelengths of light outside of said preselected wavelengths (see figure 15, optical filter Array 180), multiple messages are simultaneously transmitted along multiple wavelengths (see figure 15, data #1 out, data #2 out etc.)

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Communication system of Ohshima by incorporating a modulation device for modulating multiple messages on multiple different wavelengths as taught by Onaka, including all of the support structure, (i.e. modulation devices, etc.) in order to increase the capacity of the communication system of Drake, and further, to include the optical bandpass filter as taught by Onaka to adjust or separate the multiple wavelengths of light (see Onaka column 1 lines 32-39).

With respect to claim 6, the combination of Ohshima and Onaka as applied to claim 1 teaches all the recited elements except a barrier means adapted to be positioned between said first and second data communication devices, said barrier means preventing line-of-sight communication between said first and second data communication devices. It is obvious that Ohshima's invention overcomes a barrier means preventing line-of-sight by directing optical receivers at surfaces above said optical receivers such as directing them at a ceiling.

With respect to claim 3 and 8 Ohshima teaches Said light reflecting target is a wall of a structure adapted to house said first and second data communication devices (see column 9 lines 17-21).

With respect to claim 4 and 7 Ohshima teaches Said light reflected target is a

ceiling of a structure adapted to house said first and second data communication devices (see column 7 lines 24-26).

With respect to claims 5 and 9, Ohshima teaches Said light reflecting target is a floor of a structure adapted to house said first and second data communication devices (see column 9 lines 17-21).

Claims 12 -17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshima et al (U.S. 5,986,787) and Onaka et al (U.S.5,696,859) as applied to claims 1 and 6, above and further in view of Savicki (U.S. 5,359,189).

The Ohshima and Onaka references have been discussed above with respect to claims 1 and 6. This combination teaches all of the limitations of claim 12 with the exception of first and second optical lens means with a π to 2 π steradians field of view.

However, Savicki teaches a detector with a π to 2 π steradians field of view (see figure 2 element 201) for use in a non-directed communication system. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Communications system suggested by Ohshima and Onaka by incorporating hemispherical optical lenses with a π to 2 π steradians field of view to simplify the positioning of the need for pointing and re-aiming the detectors (see column 1, lines 43-46 and column 1, line 67-column 2, line 2).

With respect to claim 13 and 16, Savicki teaches a hemispherical lens (see figure 1 hemisphere 103; column 3 line 56).

With respect to claim 14, Ohshima teaches said first optical lens means is provided in the form of transmitter optics (see figure 1A optical lens 212; column 6 lines 31-41).

With respect to claim 15 and 17, all of the limitations of these claims have been discussed in claim 12 above. It is inherent an electrical signal must be "conditioned" to drive a transmitter and that the output of a detector must be conditioned to provide a useful electrical signal. Therefore, it would have been obvious to modify Ohshima and Onaka communication system to condition an optical signal to an electrical signal to prevent the signal from getting distort or weak during transmission.

Claims 28,29,30, 31, 32, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drake (U.S. 4,627,106) in View of *Wireless In-House Data Communication Via Diffuse Infrared Radiation*, hereafter *Wireless In-House*.

With respect to claims 28,29, 30, 31, 32,and 33 Drake teaches all the limitations of claims 18 and 20 above. Drake fail to teach multiple telescope receivers positioned at different locations.

However, *Wireless In House* teaches multiple optical transmitters and receivers positioned at different locations (see figure 1a In house environment T for terminals and figure 1b). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Communications system of Drake by incorporating multiple telescope transmitters and

receivers positioned at different locations in order to interconnect a number of different locations and devices as taught by the *Wireless In House* reference.

Related Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Both the Usenet posting *Radio Shack IR Detector* and *The RC-40 Rapture Series IR Remote Control* press release teach IR devices that bounce IR signals off walls.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ralph Jean-Bart whose telephone number is (571) 270-1017. The examiner can normally be reached on Monday to Thursday from 8 to 4:30.If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Robertson, can be reached on 571-272-4186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RJB
Ralph Jean-Bart

08/08/2006

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